

REMARKS

Reconsideration and continued examination of the above-identified application are respectfully requested.

The amendment further defines what the applicant regards as the invention. Full support for the amendment can be found throughout the present application, including the claims as originally filed. For instance, claims 1 and 16 have been amended to include the subject matter of claims 5 and 6, and 17 respectively. Accordingly, no questions of new matter should arise. Therefore, entry of this amendment is respectfully requested.

At page 2 of the Office Action, the Examiner rejects claim 28 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as the invention. The Examiner asserts that claim 28 is indefinite as it is uncertain how it can be determined that a given complex exhibits structural spectra as shown Figs. 1, 2, 3, or combination thereof, or how the figures can be combined. Further, the Examiner asserts that a claim is intended to be complete within itself; as such, any material should be within the body of the claim itself. For the following reasons, this rejection is respectfully traversed.

Claim 28 now includes Figs. 1, 2, and 3 within the claim itself. According to Ex parte Bivens, 53 U.S.P.Q.2d 1045 (Bd. Pat. App. & Int'f 1999) (unpublished opinion), limitations drawn to a chart or a diagram do not inherently conflict with the second paragraph of §112. Moreover, the spectrums shown in Figs. 1-3 clearly show the composition of the organo-metallic chelate of the present invention. Furthermore, the composition of the present invention can have characteristics of one of the charts or more than one of the charts. Combinations are possible. Accordingly, the rejection under 35 U.S.C. §112, second paragraph, should be withdrawn.

At page 3 of the Office Action, the Examiner rejects claims 1-27, 29, and 30 as being unpatentable over the judicially created doctrine of obviousness-type double patenting over claims 1-30 of U.S. Patent No. 6,242,009. The Examiner asserts that, although the conflicting claims are not identical, they are not patentably distinct from each other. For the following reasons, this rejection is respectfully traversed.

While the applicants do not necessarily agree with the rejection, in order to further the prosecution of this application, a Terminal Disclaimer is submitted with this response, wherein the owners agree that any patent issuing from the present application will expire on the same date as the expiration date of U.S. Patent No. 6,242,009, except for the exceptions set forth therein. Accordingly, this rejection should be withdrawn.

Prior to discussing the remaining merits of the rejections set forth in this Office Action, applicants wish to point out that many of the references relied upon by the Examiner do not teach or suggest the use of any of the materials set forth in those references as a microbicidal composition. Accordingly, these references would not teach or suggest the claims relating to the use of the microbicidal compositions of the present invention in controlling the growth of microorganisms or methods of controlling biofouling in a system. Moreover, the failure of the cited reference to teach or suggest the use of the composition as a microbicidal would also prevent an obviousness rejection with respect to combining references that show the addition of a disinfectant. It would not be obvious to one of ordinary skill in the art to include a disinfectant to the materials mentioned in a reference wherein that reference fails to teach or suggest the use of that material as a microbicidal composition. Thus, there would be no motivation for one having ordinary skill in the art to include a disinfectant when the composition mentioned in the reference does not even use the material for such microbicidal uses.

At page 3 of the Office Action, the Examiner rejects claims 1, 2, 4, 5, 7, 8, 9, 11, 16, 17, 19, and 21 under 35 U.S.C. §102(b) as being anticipated by or, in the alternative, under 35 U.S.C. §103(a) as being obvious over Ackermann et al. The Examiner asserts that Ackermann et al. expressly discloses a fungicide composition comprising copper, zinc, or manganese complexes of phenylalanine falling within the scope of the applicant's claims. Moreover, the Examiner asserts, at the very least, the claimed invention is rendered obvious within the meaning of 35 U.S.C. §103(a) because the cited art discloses products that contain the same exact ingredients/components as that of the claimed invention. For the following reasons, this rejection is respectfully traversed.

As set forth in the claims and described in detail in the present application, the claimed invention relates to a microbicidal composition having at least one disinfectant and a complex of at least one organic chelating moiety and at least one metal ion. The organic chelating moiety of the claimed invention is in at least one equimolar amount based on the amounts of the at least one metal ion, wherein the at least one metal ion is microbicidal to at least one microorganism and, preferably, the organic chelating moiety is an amino acid, wherein said amino acid includes a double bonded oxygen, and wherein said double bonded oxygen of said amino acid is complexed to M.

Ackermann et al. relates to the formation of compounds that result from the reaction of alkyl (CH_3 -) and/or alkoxy (R-O) substituted phenylamine ($\text{C}_6\text{H}_5\text{-N}$) with halopropionic acids ($\text{CH}_3\text{CH}_2\text{CO}_2\text{-X}$ wherein X = a halogen) and where the metal is chelated (Cu(II) , Zn(II) , Mn(II) , Co(II) , Ni(II) , or Fe(II)/Fe(III)). Unlike the claimed invention, the starting material in Ackermann et al. is not an amino acid, but an amine. An amine is not an amino acid. Additionally, the metals of Ackermann et al. are not chelated with phenylalanine, but with phenylamines (which are not amino acids). Ackermann et al. does not teach or suggest antibacterial effects. Indeed, only

Amendment

U.S. Patent Application No. 09/761,561

fungicide uses are mentioned. Accordingly, the rejection under 35 U.S.C. § 102(b) or, in the alternative, under 35 U.S.C. § 103(a) over Ackermann et al. should be withdrawn.

At page 4 of the Office Action, the Examiner rejects claims 1, 2, 4, 5, 7, 8, 9, 11, 16, 17, 19, and 21 under 35 U.S.C. § 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Jain et al. The Examiner asserts that Jain et al. expressly discloses a method of treating fungus and a composition comprising cadmium or copper complexed with lysine falling within the scope of the applicant's claims. Alternatively, the Examiner asserts that, at the very least, the claimed invention is rendered obvious within the meaning of 35 U.S.C. § 103, because the cited art discloses products and the use of those products that contain the same ingredients of the claimed invention. For the following reasons, this rejection is respectfully traversed.

Jain et al. relates to the formation of metal complexes (Ba, Sr, Cd, Vo, Sb, Gd, Ce, Fe, Cu, or Bi) with L-lysine to be used as antifungals. The experiment in Jain et al. was conducted under a neutral pH, that is, diluted water. The neutral pH solution causes a chelation to occur between the metal and the coordinated oxygen atom (hydroxyl group of the carboxylic group), whereas the chelation of the claimed invention occurs between the metal and the uncoordinated oxygen atom of the carboxylic acid group (double bonded oxygen of the carboxylic group). Jain et al. also does not teach or suggest complexes to be used as bactericides, as they are only used as fungicides. Also, Jain et al. does not teach or suggest having at least one organic chelating moiety, at least one metal ion, and at least one disinfectant. Accordingly, the rejection under 35 U.S.C. § 102(b) or, in the alternative, under 35 U.S.C. § 103(a) over Jain et al. should be withdrawn.

At the bottom of page 4, the Examiner rejects claims 1-5, 7, 8, 11, 13, 16-18, 21, and 22 under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as being obvious over Poddymov et al. or Sanchez et al. The Examiner asserts that Poddymov et al. or

Amendment

U.S. Patent Application No. 09/761,561

Sanchez et al. teach a method of chelating silver with amino acids in acidic conditions at room temperature. The Examiner also asserts that, at the very least, the claimed invention is rendered obvious within the meaning of 35 U.S.C. §103, because the cited art discloses products and uses that contain the same exact ingredients/components as that of the claimed invention. For the following reasons, this rejection is respectfully traversed.

Poddymov et al. relates to determining the acid dissociation in Ag complexation constants for glycine, methionine, and aspartic acid at 30°C. Poddymov et al. does not teach or suggest that these complexes are to be used as bactericides. Moreover, Poddymov et al. does not teach or suggest a complex having at least one organic chelating moiety, at least one metal ion, and at least one disinfectant. Therefore, the reasons set forth above with respect to the patentability of those claims would also apply here. Accordingly, the rejection under 35 U.S.C. §102(b) or, in the alternative, under 35 U.S.C. §103(a) over Poddymov et al. should be withdrawn.

Sanchez et al. relates to determining the thermodynamical stability constant of Ag with phenylalanine, alanine and serine. Sanchez et al. does not teach or suggest its composition to be used as bactericides. Moreover, Sanchez et al. does not teach or suggest a complex having at least one disinfectant, at least one chelating moiety, and at least one metal ion. Accordingly, the rejection under 35 U.S.C §102(b) or, in the alternative, under 35 U.S.C. §103(a) over Sanchez et al. should be withdrawn.

Further, Poddymov et al. relates to determining the acid dissociation and Ag complexation constants and Sanchez et al. relates to determining the thermodynamic stability constant of Ag with phenylalanine, alanine and serine. Therefore, it is unlikely that one skilled in the art would combine these references. Moreover, as stated above, neither Poddymov et al.

Amendment

U.S. Patent Application No. 09/761,561

and/or Sanchez et al. teach or suggest a complex having at least one disinfectant, at least one chelating moiety, and at least one metal ion. Thus, the combination of Poddymov et al. and Sanchez et al. also do not teach or suggest a complex having a formula of at least one chelating moiety and at least one metal ion, and at least one disinfectant. Accordingly, the rejection under 35 U.S.C. §103(a) over Poddymov et al. in view of Sanchez et al. should be withdrawn.

At page 5 of the Office Action, the Examiner rejects claims 1-27, 29, and 30 under 35 U.S.C. §103(a) as being unpatentable over Gomori et al. (U.S. Patent No. 4,915,955) in view of Tsivion (International Publication Application No. WO 97/33477), Ackermann et al., Tumanov et al., Khurshid, Yamashita et al., Ali-Mohamed et al., Kawada et al., Modak et al. (U.S. Patent No. 5,708,023) Goodman, and Gilman's, Poddymov et al., and Sanchez et al. The Examiner asserts that Gomori et al. teaches a composition containing a silver salt or a colloidal silver in an organic stabilizer, which is effective as a disinfectant. The Examiner further asserts that Tsivion teaches that copper, manganese, and zinc ions are known to have antifungal properties, and chelates of the same are known in the art. According to the Examiner, Tsivion also teaches that aluminum and/or zinc chelates of citric acid or glycine are suitable as antibacterial/antifungal agents. Moreover, the Examiner asserts that Ackermann et al. teaches that di- or trivalent metal ions, for example, copper, zinc, manganese, cobalt, and nickel chelated with phenylalanine, have antifungal activity.

The Examiner further asserts that Tumanov et al. teaches that copper complexes with alpha-amino acids have antimicrobial activity. Moreover, according to the Examiner, Khurshid teaches that zinc complexes of alanine have antibacterial activity. The Examiner also asserts that Yamashita et al. teaches that antibacterial metals, silver, copper, and zinc, chelated with long-chain acyl basic amino acids have both antibacterial and surface activities. Furthermore, the

Amendment

U.S. Patent Application No. 09/761,561

Examiner asserts that Ali-Mohamed et al. teaches that cobalt chelated with glycine, alanine, or valine has antibacterial activity. The Examiner also asserts that Kowada et al. teaches that copper chelated with methionine or pentocystine is effective as a bactericidal/fungicidal agent. Additionally, the Examiner asserts that Modak et al. teaches that antimicrobial agents, such as chlorhexidine and other synergistic agents described in Goodman and Gilman's, act synergistically with zinc and silver. Moreover, the Examiner asserts that Goodman and Gilman's teaches that isopropanol is used as a vehicle for other germicidal compounds. Finally, the Examiner asserts that Poddymov et al. and Sanchez et al. teach methods of preparing silver chelates of amino acids at room temperature in acidic conditions.

The Examiner acknowledges that the references above do not expressly disclose an antimicrobial composition, which comprises an antimicrobial metal ion chelated with an amino acid in combination with another antimicrobial agent, such as chlorhexidine, isopropanol, or hydrogen peroxide. However, the Examiner asserts that it is known in the art to formulate an antimicrobial composition comprising metal chelates with amino acids, and that antimicrobial agents, such as hydrogen peroxide, may be synergistically combined with antimicrobial metal ions and/or their metal chelates. The Examiner finally concludes that one of ordinary skill in the art would have been motivated to modify the prior art with the expectation that metal ions chelated with alpha-amino acids would be effective antimicrobial agents, and that the further addition of hydrogen peroxide would have a synergistic effect with the metal chelate. For the following reasons, this rejection is respectfully traversed.

As stated earlier, the microbicidal composition of the claimed invention includes at least one disinfectant, a complex having at least one organic chelating moiety and at least one metal ion. Furthermore, the organic chelating moiety is present in at least an equimolar amount based

on the amount of at least one metal ion, wherein the metal ion is microbicidal to at least one microorganism and the organic chelating moiety is an amino acid, wherein said amino acid includes a double bonded oxygen, and wherein said double bonded oxygen of said amino acid is complexed to M. The complex of the claimed invention is formed between the organic chelating moiety and the metal ion. Therefore, the metal ion is not in a solution. As further explained in the specification, the chelating moiety, which is formed from at least one amino acid, is chosen so as to make use of the lone pair of electrons on the nitrogen atom of the amino acid where the metal ion chelates with the nitrogen atom and the carbonyl group. This is what the applicants believe forms the complex, but the applicants do not wish to be held by this understanding only. In addition, the biocidal activity of the claimed invention results from the solubility of the organic chelating moiety portion of the complex in the biofilm of the microorganism, in which the metal ions are released intracellularly where they can exhibit their biocidal activities from within. Further, the applicants have shown in the application a preferred embodiment of this complex and its bioactivity.

Gomori relates to a disinfectant, which is formed when hydrogen peroxide is mixed with a concentrate. The concentrate contains silver, an inorganic acid, and an organic stabilizer. The organic stabilizer is preferably tartaric acid or citric acid. At columns 2 and 3 of Gomori, additional organic acid stabilizers are set forth. However, none of the acids set forth at columns 2 and 3 of Gomori are amino acids. The acids provided in Gomori are carboxylic acids and amides, and are not amino acids. Also, Gomori is not using the organic acid stabilizer as a biocide component, but simply as a stabilizer in order to be a UV protector for the hydrogen peroxide and silver, as emphasized by Gomori throughout the specification. The concentrate of

Amendment

U.S. Patent Application No. 09/761,561

Gomori is used to promote durability of the hydrogen peroxide. As such, for the reasons set forth above, Gomori does not teach or suggest the claimed invention.

In addition, the silver that is present in the concentrate of Gomori does not complex or form a complex with the organic acid stabilizer of Gomori. As indicated in the specification of Gomori, and in particular, column 3, lines 59-61, Gomori specifically indicates that if the ratio of hydrogen peroxide and silver is less than 1:99, "the possibility arises that the silver will precipitate from the admixture." This clearly implies that the silver is present in the solution and is not part of a complex. Gomori does not teach or suggest that the organic acids complex with Ag. Instead, Gomori shows that they are stabilizers to Ag (e.g., column 2, lines 37-38, 42-43, 65-66; column 6, lines 28-29). Also, Gomori indicates that the inorganic acids act as stabilizers for Ag as well, and not as complexes (column 3, lines 20-24).

In an effort to examine the effect of adding tartaric acid instead of glutamic acid on the silver solution, the applicants performed the following experiment. If helpful, upon the Examiner's request, the applicants will submit this experiment in the form of a 1.132 Declaration. The silver solution was prepared in accordance with the patent application. It was observed that if glutamic acid is added to the silver solution, then a yellowish precipitate is instantly observed, and if tartaric acid is added to the silver solution no precipitate is observed. This clearly ascertains the fact that the products of reactions for these systems are different, and therefore the solution equilibria are different as well.

Finally, Gomori does not teach or suggest that the concentrate alone acts as a disinfectant. In fact, Gomori indicates the complete opposite. According to Gomori, the concentrate of Gomori must be admixed with the hydrogen peroxide synergistically to form the disinfectant of Gomori. Clearly, according to Gomori, hydrogen peroxide is necessary. While the applicants

appreciate that the claims as pending use the term "comprising", the applicants merely offer this comment to emphasize that Gomori is specifically teaching that the concentrate alone is not an effective disinfectant.

Also, the secondary references do not overcome the deficiencies of Gomori. To begin with, the Examiner has provided no explanation on how these references are combinable and how one skilled in the art would be motivated to modify the teaching of Gomori. Thus, the Examiner has not met his burden of establishing a *prima facie* case of obviousness.

Further, Tsivion relates to combating fungal and bacterial pests in plants by using Al and/or Zn with either citric acid or a neutral amino acid glycine. No other metals are suggested and no basic or acidic amino acids are suggested. The pH is relatively high for the reaction conditions, unlike the claimed invention. Because the pH in Tsivion is relatively high, the chelation occurs between the metal and the coordinated oxygen atom. However, in the claimed invention, the chelation occurs between the metal and the uncoordinated oxygen atom of the carboxylic acid group. Moreover, unlike the claimed invention, which can be used on a broad spectrum of microorganisms and a plethora of applications, Tsivion is only used on plant pests. As such, for the reasons set forth above, Tsivion does not teach or suggest the claimed invention.

With respect to Ackermann et al., as mentioned above, Ackermann et al. does not teach or suggest the use of at least one organic chelating moiety, at least one metal ion, and at least one disinfectant, wherein the organic chelating moiety is an amino acid.

Tumanov et al. relates to the formation of complexes between Cu(II) and neutral alpha amino acids (glycine, alanine, and serine) where it can be used as bactericides. The only metal used is Cu(II). Additionally, no disinfectant is taught or suggested. Moreover, as shown in Tumanov et al., the chelation in Tumanov et al. occurs between Cu(II) and the coordinated

oxygen atom, unlike the claimed invention where the chelation occurs between the metal and the uncoordinated oxygen atom of the carboxylic acid group. As such, for the reasons set forth above, Tumanov et al. does not teach or suggest the claimed invention.

Khurshid relates to the formation of amino acid complexes with Zn(II) and Fe(II) to be used as bactericides. The method of preparing the amino acid complex of Khurshid is shown in J.R.J. Sorenson (*J. Med. Chem.*, 19) pp. 135-148, (1976), in which the preparation takes place in a basic environment (pg. 144, column 2, lines 18-19; “the solution to be weakly basic”). Moreover, no inorganic acid is used in forming the complex of Khurshid. Thus, unlike the claimed invention, the composition of Khurshid does not form a chelation between the metal and the uncoordinated oxygen atom of the carboxylic acid group.

Yamashita et al. relates to the formation of antibacterial substrates from N-(long-chain acyl RCO-) basic amino acids with Ag, Cu, or Zn under strong alkaline conditions. This solution is highly basic. Therefore, unlike the claimed invention where the chelation occurs between the metal and the uncoordinated oxygen atom of the carboxylic acid group, the chelation of Yamashita et al. occurs between the metal and the coordinated oxygen atom. As such, for the reasons set forth above, Yamashita et al. does not teach or suggest the claimed invention.

Ali-Mohamed et al. relates to the formation of Co(III) complexes with an organic dicarboxylic oxalate $^{-}\text{OOC-COO}^{-}$ and amino acids (glycine, alanine, or valine) to be used as bactericides. The chemical structure and constituents are totally different from the claimed invention. In essence, the Co coordinates with one nitrogen and three coordinated oxygen atoms (one from the amino acid and two from the oxalate), which is different from the claimed invention, which utilizes just amino acids, not an oxalate. Moreover, the only metal used in Ali-Mohamed is

Co. Thus, for the reasons set forth above, Ali-Mohamed et al. does not teach or suggest the claimed invention.

Kawada et al. relates to the formation of complexes between neutral amino acids, such as methionine or pentocystine, with copper to control plant infections. Except for plants, there is no suggestion for these complexes to be used as bactericides. Further, the only metal used is Cu. Moreover, no disinfectants are taught or suggested. Moreover, unlike the claimed invention, where the coordination occurs between the metal and the uncoordinated oxygen atom of the carboxylic acid group, the chelation in Kawada et al. occurs between the metal and the coordinated oxygen atoms. Thus, for the reasons set forth above, Kawada et al. does not teach or suggest the claimed invention.

Modak et al. relates to the formation of a gel (not an insoluble complex) from zinc gluconate ($C_{12}H_{22}O_{14}Zn$), which is not an amino acid. The product of Modak et al. can be employed as a carrier for an irritant inactivating agent when applied to the skin or physical barriers. This gel does not bind to surfaces, especially skin, but forms a continuous film where the antimicrobial agent can be dispersed and distributed evenly so as to preclude these harmful chemicals from binding to the skin. Relatively soluble zinc and silver salts in Modak et al. are used to block binding sites on the skin, and the metals are not used as antimicrobial agents (column 6, lines 61-67, and column 7, lines 1-5). Also, none of these soluble salts are of an amino acid complexation origin with either Zn or Ag. Moreover, contrary to the Examiner's suggestion, the zinc and the silver salts do not exhibit microbicidal activities (column 8, lines 52-55). Moreover, Modak et al. does not teach or suggest any other metals that can be used. Accordingly, the product of Modak et al. is a non-amino acid gel where it serves as a carrier to other disinfectants. Even though Modak et al. indicates the use of other disinfectants as described in Goodman and Gilman's

Amendment

U.S. Patent Application No. 09/761,561

“The Pharmacological Basis of Therapeutics,” Mokak et al. does not teach or suggest adding these other disinfectants with metals that have been chelated with amino acids. As such, for the reasons set forth above, Modak et al. does not teach or suggest the claimed invention.

Goodman and Gilman's provides some antimicrobial reagents. However, Goodman and Gilman's does not teach or suggest that any of these reagents are metals chelated with amino acids. There is no teaching or suggestion that, when these compounds are combined with amino acids, they chelate to form disinfectants. As such, for the reasons set forth above, Goodman and Gilman's does not teach or suggest the claimed invention.

With respect to Poddymov et al. and Sanchez et al., as stated earlier, these two references do not teach or suggest the claimed invention.

Finally, the combination of all of the cited references relied upon by the Examiner does not teach or suggest the composition of the claimed invention wherein a chelation occurs between the metal and the uncoordinated oxygen atom of a carboxylic acid group and wherein the composition includes at least one disinfectant. Moreover, Poddymov et al. relates to determining the acid dissociation and Ag complexation constants and Sanchez et al. relates to determining the thermodynamic stability constant of Ag with phenylalanine. Additionally, some of the references, such as Tsivion, relate to combating fungal and bacterial pests in plants. Therefore, it is unlikely that one skilled in the art would combine these references. Accordingly, the rejection under 35 U.S.C. § 103(a) over Gomori et al. in view Tsivion, Ackermann et al., Tumanov et al., Khurshid, Yamashita et al., Ali-Mohamed et al., Kawada et al., Modak et al., Goodman and Gilman's, Poddymov et al., and Sanchez et al. should be withdrawn.

In an effort to examine the effect of pH on the product formed from the chelation of silver with glutamic acid, the applicants performed the following experiment. If helpful, upon the

Amendment

U.S. Patent Application No. 09/761,561

Examiner's request, the applicants can submit this experiment in the form of a 1.132 Declaration.

Silver solution under acidic conditions was prepared in accordance with the present invention.

Another silver solution was prepared again in accordance with the present invention, but no phosphoric acid was added. The pH of the acidic solution was 1.28, and that of the basic was 6.8.

Each solution had a volume of 2.3 ml. An equimolar amount of glutamic acid with respect to silver was then added to each solution. It was observed that an insoluble product was formed at a pH of 1.28 and was yellowish, thick and slimy while the other formed at a pH of 6.8 and was white and powdery. To examine whether the product formed at a pH of 1.28 changed its appearance as a result of the pH increase, the acidic solution which contained the yellowish, thick, and slimy precipitate was centrifuged, and the supernatant was collected, and immersed in double-distilled-deionized water. No changes were recorded, verifying that the precipitates remain the same. Clearly, different products are formed at different pHs.

The Examiner is encouraged to contact the undersigned by telephone should there be any remaining questions concerning the allowability of claims as pending.

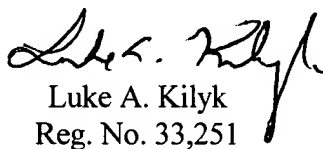
Amendment
U.S. Patent Application No. 09/761,561

CONCLUSION

In view of the foregoing remarks, Applicants respectfully request the reconsideration of this application and the timely allowance of the pending claims.

If there are any other fees due in connection with the filing of this response, please charge the fees to Deposit Account No. 50-0925. If a fee is required for an extension of time under 37 C.F.R. § 1.136 not accounted for above, such extension is requested and should also be charged to said Deposit Account.

Respectfully submitted,


Luke A. Kilyk
Reg. No. 33,251

Atty. Docket No. 3731-002
KILYK & BOWERSOX, P.L.L.C.
53 A East Lee Street
Warrenton, VA 20186
Tel: (540) 428-1701
Fax.: (540) 428-1720

VERSION WITH MARKINGS TO SHOW CHANGES MADE

1. (Amended) A microbicidal composition comprising at least one disinfectant and a complex of the formula R-M, wherein R is at least one organic chelating moiety and M is at least one metal ion, and where R is present in an at least equimolar amount based on the amount of M, and M is microbicidal to at least one microorganism, wherein said at least one organic chelating moiety is an amino acid, wherein said amino acid includes a double bonded oxygen, and wherein said double bonded oxygen of said amino acid is complexed to M.

9. (Amended) A method to control the growth of microorganisms comprising contacting the microorganisms with a microbicidal composition comprising [the microbicidal composition of claim 1] a complex of the formula R-M, wherein R is at least one organic chelating moiety and M is at least one metal ion, and where R is present in an at least equimolar amount based on the amount of M, and M is microbicidal to at least one microorganism, wherein said at least one organic chelating moiety is an amino acid, wherein said amino acid includes a double bonded oxygen, and wherein said double bonded oxygen of said amino acid is complexed to M, and wherein said composition kills said microorganisms intracellularly.

13. (Amended) A method to prepare the microbicidal composition [of claim 1] comprising a complex of the formula R-M, wherein R is at least one organic chelating moiety and M is at least one metal ion, and where R is present in an at least equimolar amount based on the amount of M, and M is microbicidal to at least one microorganism, wherein said at least one organic chelating moiety is an amino acid, wherein said amino acid includes a double bonded oxygen, and wherein said double bonded oxygen of said amino acid is complexed to M, wherein said method comprises dissolving a salt containing metal in at least one inorganic acid and an aqueous source; and

adding at least one organic chelating compound containing R to form a metal complex having the formula R-M, wherein the preparation of the composition occurs at a pH of about 2.0 or less.

14. (Amended) The microbicidal composition of claim [6] 1, wherein said at least one disinfectant comprises one or more of chlorhexidine gluconate, chlorhexidine digluconate, chlorhexidine dihydrochloride, and chlorhexidine diacetate.

15. (Amended) The microbicidal composition of claim [6] 1, wherein said at least one disinfectant comprises one or more of isopropyl alcohol and hydrogen peroxide.

16. (Amended) A microbicidal composition comprising at least one disinfectant and a product obtained by combining, at least one metal ion (M) with at least an equimolar amount of at least one organic chelating moiety (R) based on the amount of M, wherein M is microbicidal to at least one microorganism, wherein said at least organic chelating moiety is an amino acid, wherein said amino acid includes a double bonded oxygen, and wherein said double bonded oxygen of said amino acid is complexed to M.

21. (Amended) A microbicidal composition comprising a disinfectant and a complex of the formula R-M, wherein R is at least one organic chelating moiety and M is at least one metal ion, and where R is present in an at least equimolar amount based on the amount of M, and M is microbicidal to at least one microorganism, wherein said at least one organic chelating moiety is formed from an amino acid, and said organic chelating moiety has a carboxylic group which forms a dative covalent bond with M, and wherein said carboxylic group includes a double bonded oxygen which is complexed to M.

23. (Amended) A method for preserving cut flowers or plants from pathological

Amendment

U.S. Patent Application No. 09/761,561

microorganisms comprising:

treating said flowers and plants with the microbicidal composition [of claim 1]
comprising a complex of the formula R-M, wherein R is at least one organic chelating moiety
and M is at least one metal ion, and where R is present in an at least equimolar amount based on
the amount of M, and M is microbicidal to at least one microorganism, wherein said at least one
organic chelating moiety is an amino acid, wherein said amino acid includes a double bonded
oxygen, and wherein said double bonded oxygen of said amino acid is complexed to M.

26. (Amended) A method for protecting living flowers or plants comprising treating
said flowers and plants with the microbicidal composition [of claim 1] comprising a complex of
the formula R-M, wherein R is at least one organic chelating moiety and M is at least one metal
ion, and where R is present in an at least equimolar amount based on the amount of M, and M is
microbicidal to at least one microorganism, wherein said at least one organic chelating moiety is
an amino acid, wherein said amino acid includes a double bonded oxygen, and wherein said
double bonded oxygen of said amino acid is complexed to M.

28. (Amended) A microbicidal composition comprising an organo-metallic chelate of
silver cations and glutamic acid [cations], wherein the chelate exhibits the structural spectra
depicted in Figures 1, 2, or 3, or combinations thereof below:

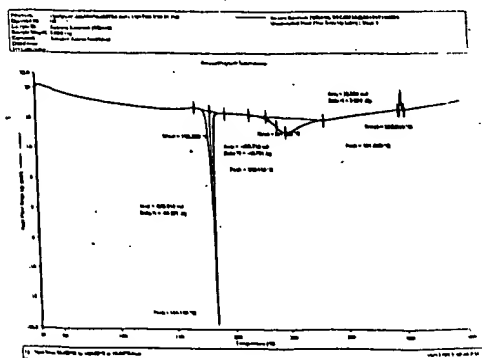


Figure 1. DSC Spectrum.

Amendment
U.S. Patent Application No. 09/761,561

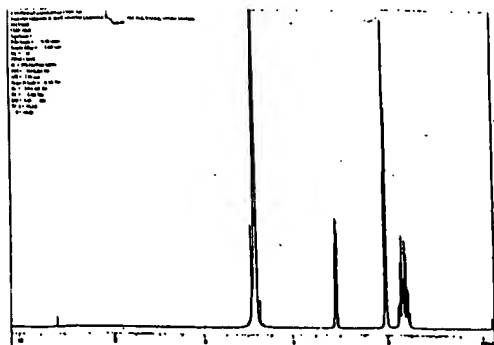


Figure 2. Proton NMR Spectrum.

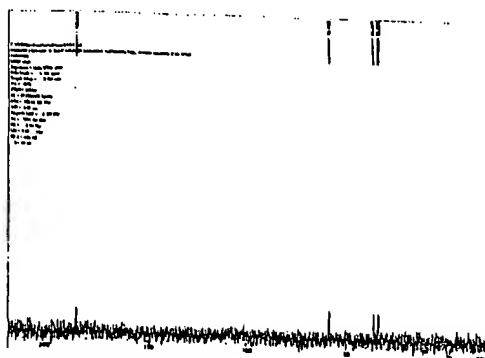


Figure 3. Carbon NMR Spectrum.